User Manual

+PROTOCONMB

(Dozeener DZC-ProtoCon-IE1)

Power Supply Modbus Protocol Converter



with Interface Programmer Software
Power MBLink v1.3

25/09/13

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TABLE OF CONTENTS

TABLE OF CONTENTS 2

INTRODUCTION 3

RESETTING TO DEFAULT COMMUNICATION PARAMETERS 4

PROGRAMMING CABLE 4

DIMENSIONS 4

WIRING DIAGRAM 5

INFORMATION AVAILABLE 6

PROGRAMMING THE PROTOCOL CONVERTER 6

1. CONFIGURATION 7
2. MODBUS MONITOR 8
3. SETTINGS & DIAGNOSTICS 9

SERIAL MODBUS RTU PROTOCOL 10

COMMUNICATION SETTINGS 10

MODBUS REGISTER SET (MODBUS FUNCTIONS 3, 6, 16 & 22) 11

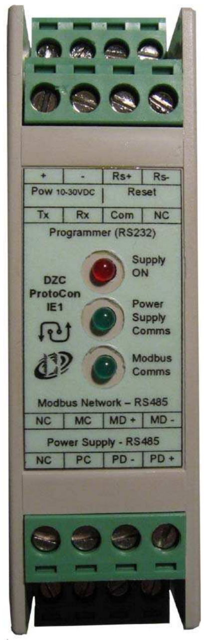
General 11
Digital Monitoring 11
Revised Digital Monitoring Bits 11
Original Digital Monitoring Bits 12
Digital Control 13
Analogue Parameters 13
Analogue Settings 14

MODBUS COIL (BIT) SET (MODBUS FUNCTIONS 1, 5 & 15) 15

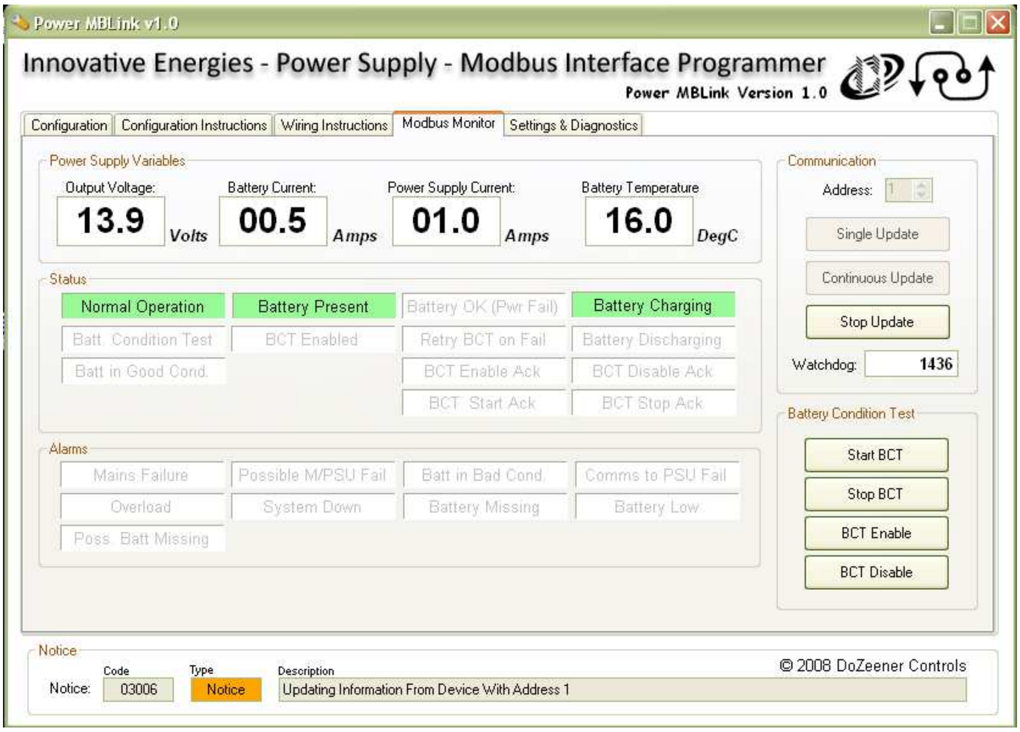
Monitoring 15
Revised Digital Monitoring Bits 15
Original Digital Monitoring Bits 16
Control 17

REVISION HISTORY 18





This product must be used with Innovative Energies power supplies and *No-Break*[TM]*DC* chargers with a RS485 serial interface.
The ‘Power MBLink’ software is used to configure the Modbus address and baud rate of the interface.
Its primary function is to monitor in real time the various power supply parameters as well as control the battery condition function via the Modbus port. These parameters may also be monitored via the RS232 programming port using a PC.



RESETTING TO DEFAULT COMMUNICATION PARAMETERS

To reset to the default communication settings of

- Modbus address 1
- Baud rate 9600
- No parity
- 8 data bits and
- 1 stop bit

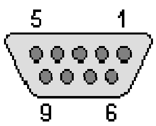
The reset connections RS+ and RS- must be shorted while powering up the device, then removed after approximately 5 seconds.

PROGRAMMING CABLE

Connections to protocol converter:

White – C (Common)
Black – RX
Red – TX

DB9 pin out (PC end):

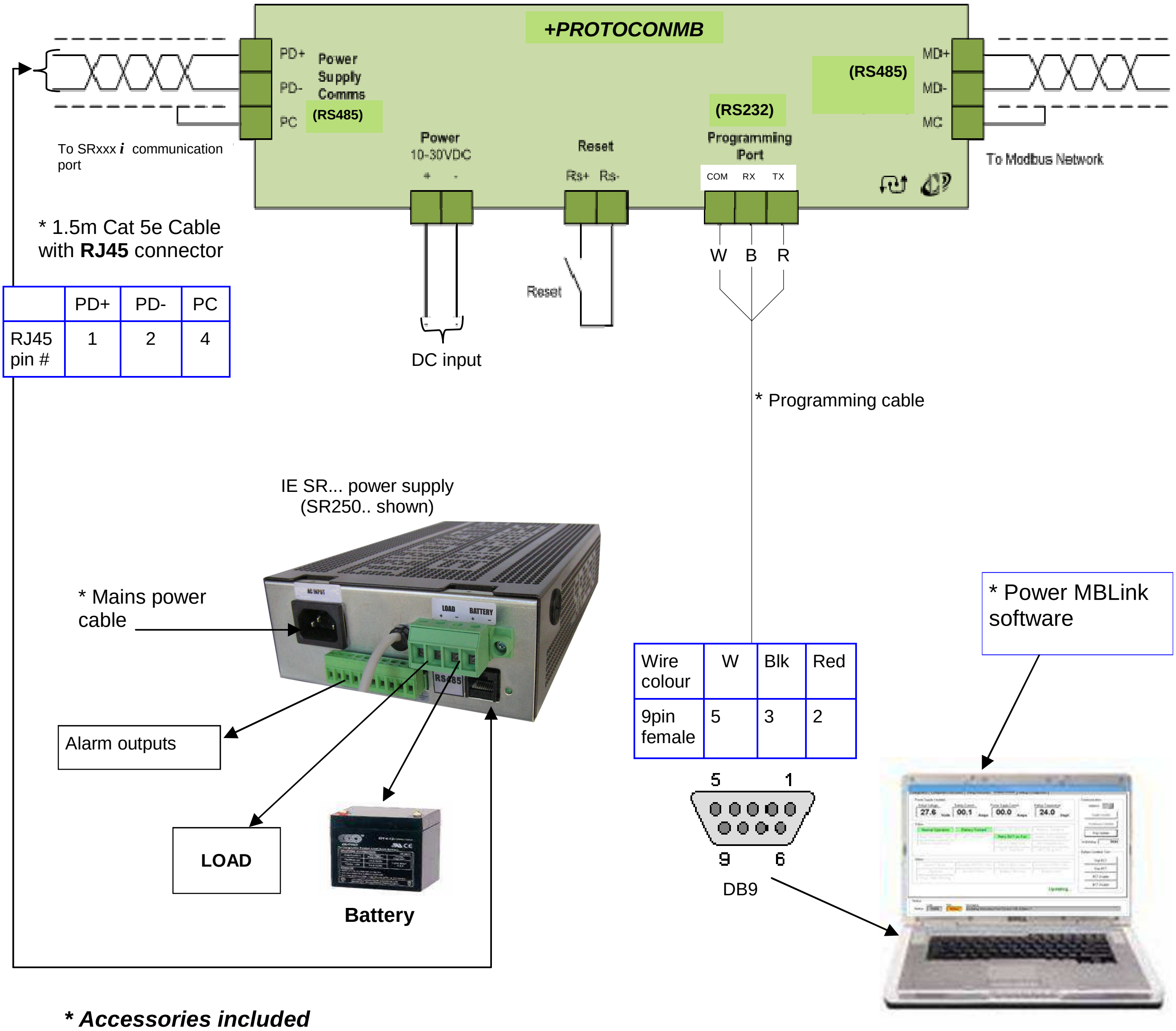


White – 5
Black - 3
Red - 2

DIMENSIONS

25 W x 90 H x 120 D mm

WIRING DIAGRAM



	PD+	PD-	PC
RJ45 pin #	1	2	4

Wire colour	W	Blk	Red
9pin female	5	3	2

**** Accessories included***

INFORMATION AVAILABLE VIA MODBUS LINK OR LOCAL PROGRAMMING PORT

Continuously Updated Variables:

- Output Voltage
- Battery Current
- Power Supply Current
- Battery Temperature

Alarms

- Mains Failure
- Possible Mains/PSU Fail
- Battery in Bad Condition
- Communications to PSU Fail (eg. on LV disconnect)
- Overload
- System Down
- Battery Missing
- Battery Low

Alarm State Signals:

- Normal Operation
- Battery Present
- Battery OK (on input power fail)
- Battery Charging
- Battery Condition Test
- BCT enabled
- Retry BCT on fail
- Battery Discharging
- Battery in Good Condition
- Possible battery missing (battery fully charged)

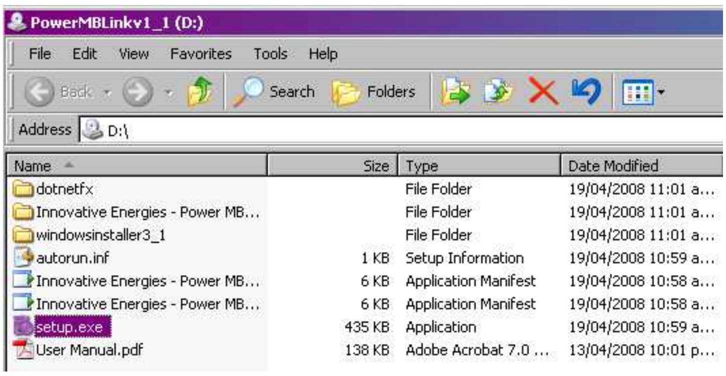
Command Functions:

- BCT Enable Acknowledge
- BCT Disable Acknowledge
- BCT Start Acknowledge
- BCT Stop Acknowledge

PROGRAMMING THE PROTOCOL CONVERTER

The protocol converter is supplied with programming software, network cable and serial programming cable. The software enables the user to set the baud rate and modbus address of the device while also making it possible to monitor the various power supply parameters.

Install Software from CD 'Power MBLink v1.3' by clicking on **Setup.exe**



Click Start / 'All Programs / DoZeener Controls / Innovative Energies Power MBLink v1.3'

1.0 Configuration

1.1 Communication Settings

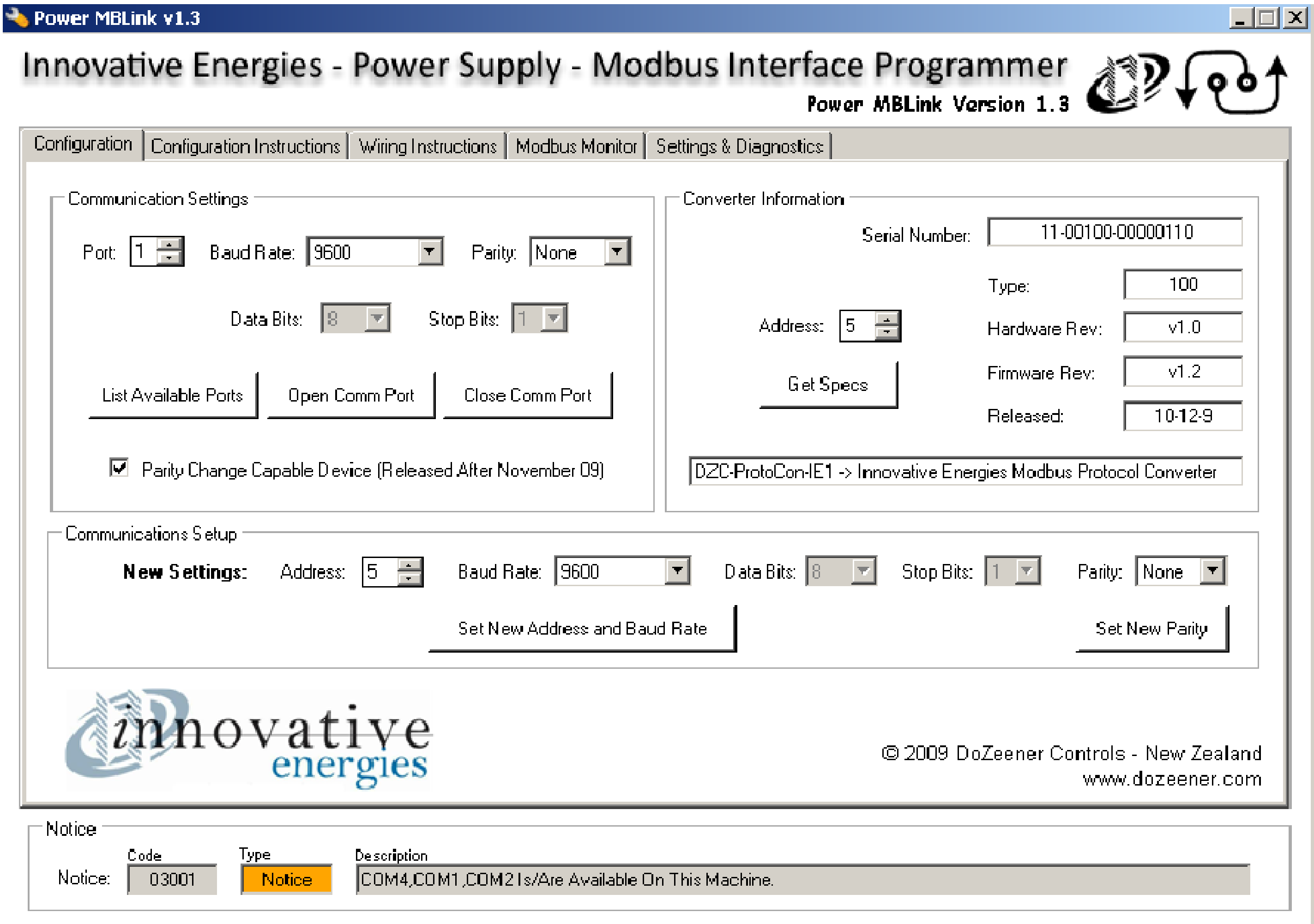
'List Available Ports' shows ports available on the PC. Select the port to which the protocol converter is connected.

1.2 Converter Information

Set "Address' to which the converter has been set (default = 1)
Key "Get Specs' to show the details of the converter.

1.3 Communication Setup

Enables the user to change the settings on the converter.



2.0 Modbus Monitor

2.1 Communication

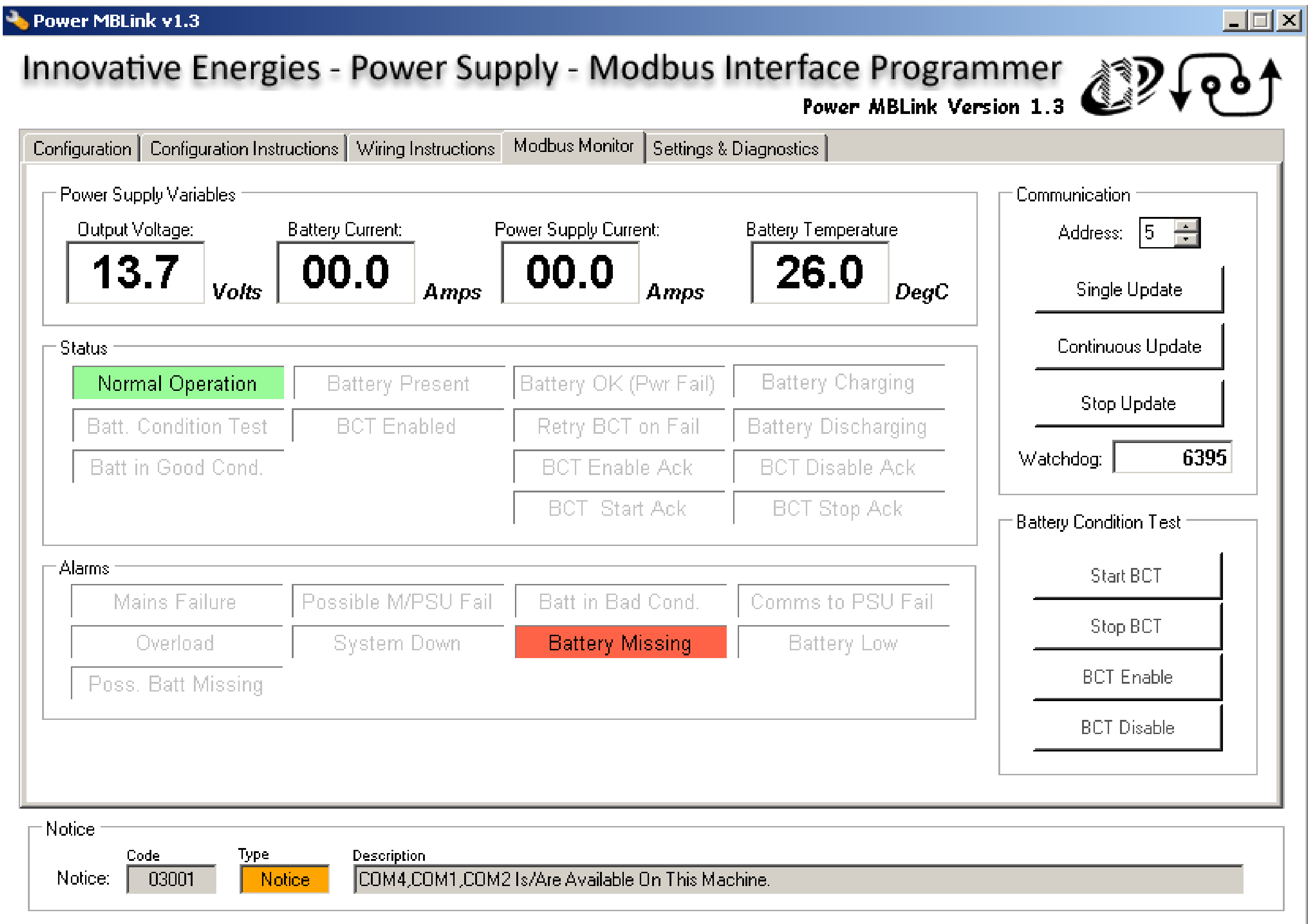
'Address' is the address set in 1.2 and 1.3.

2.2 Single / Continuous Update

Click to display 'Power Supply Variables', 'Status' and 'Alarms'

2.3 Battery Condition Test

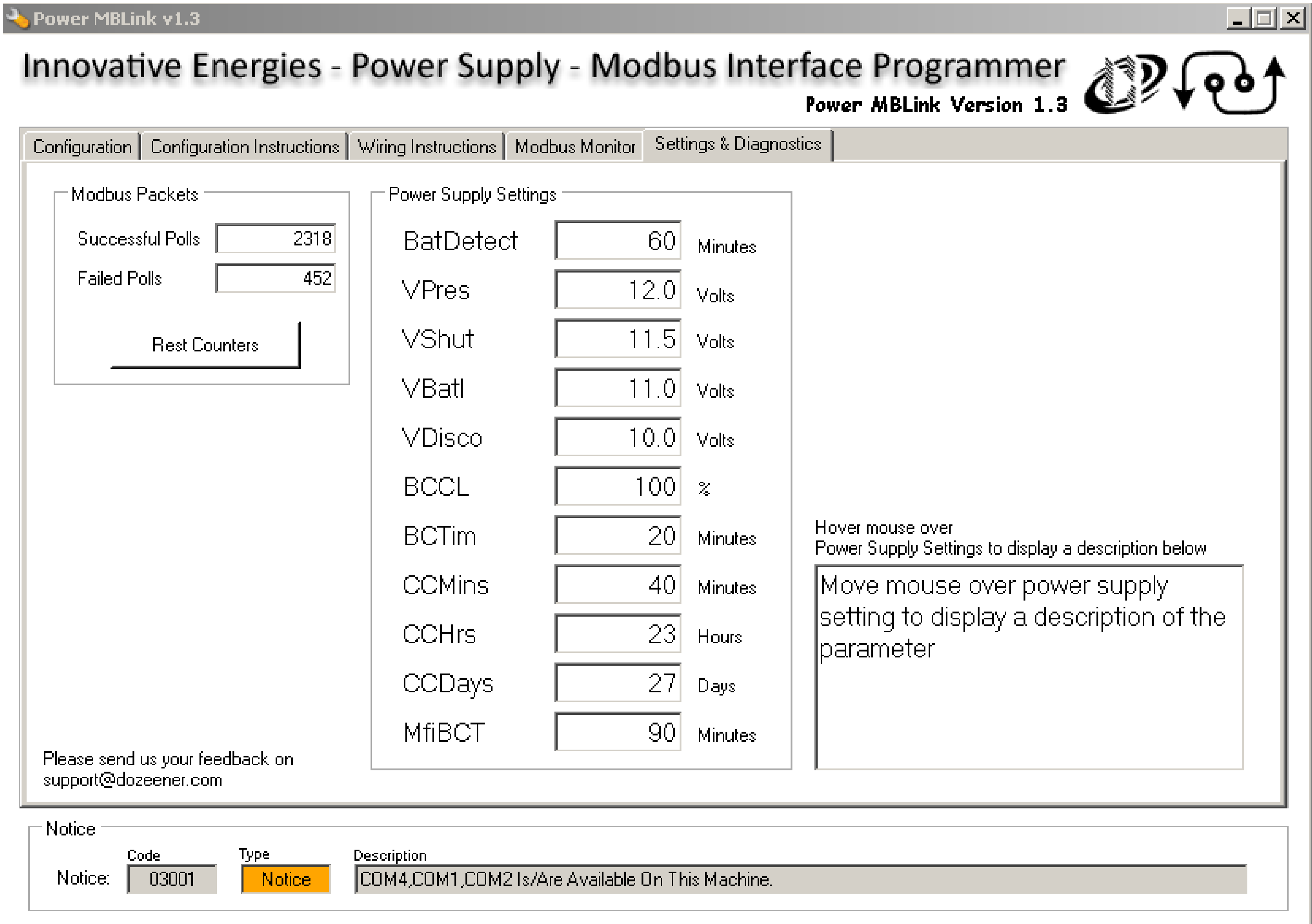
Click to control battery condition test on system.



3.0 Settings & Diagnostics

3.1 Power Supply Settings

Shows the settings of the firmware in the power supply micro controller.



SERIAL MODBUS RTU PROTOCOL

The PROTOCONMB is compatible with the following Modbus function codes:

01 – Read Coil Status
03 – Read Holding Registers
05 – Force Single Coil
06 – Preset Single Register
15 – Force Multiple Coils
16 – Preset Multiple Registers
22 – Mask Write 4x Register

A maximum of 80 coils can be polled at one time using function 01
A maximum of 32 register can be polled at one time using function 03
A maximum of 5 register can be preset at one time using function 06
A maximum of 32 coils can be preset at one time using function 15

Modbus ASCII mode is not supported.

COMMUNICATION SETTINGS

The communication parameters of the protocol converter can be changed via the software “Power MBLink”
The following Baud Rate Settings are possible:

- 9600
- 14400
- 19200
- 38400
- 56000
- 57600
- 115200

The Modbus slave device also can be changed via the software
Parity can be changed to None, Odd, Even, Space and Mark only to models released after November 2009.
The Data Bits and Stop Bits cannot be changed and are set as 8 and 1 respectively.

MODBUS REGISTER SET (MODBUS FUNCTIONS 3, 6, 16 & 22)

General

Reference	Modbus Address	Description	Type	Read/ Write
Watchdog	40001	Watchdog	Register	R

Digital Monitoring

Revised Digital Monitoring Bits

Modbus Address	Description	Type	Read/ Write
BCT Related Digitals			
40008:1	BCT Active	Bit	R
40008:2	BCT Status(Enabled/Disabled)	Bit	R
40008:3	BCT Start (Acknowledge)	Bit	R
40008:4	BCT Stop (Acknowledge)	Bit	R
40008:5	BCT Enable (Acknowledge)	Bit	R
40008:6	BCT Disable (Acknowledge)	Bit	R
Information Digitals			
40009:1	Charge Cycle	Bit	R
40009:2	Battery Ok	Bit	R
40009:3	Battery Present	Bit	R
40009:4	Battery Possibly Missing	Bit	R
40009:5	Possible Mains Fail (Brown Out)	Bit	R
40009:6	Battery Sign (Set for Negative/Discharge)	Bit	R
40009:7	Temperature Sign (Set for Negative)	Bit	R
40009:8	Retry Battery Test on Fail	Bit	R
Alarm Digitals			
40010:1	Battery Bad	Bit	R
40010:2	Battery Missing	Bit	R
40010:3	Overload	Bit	R
40010:4	Communications Fail to Power Supply	Bit	R
40010:5	System Down	Bit	R
40010:6	Battery Low	Bit	R
40010:7	Mains Failure	Bit	R

Original Digital Monitoring Bits

The following registers have been replaced with the ones in the previous section *'Revised digital monitoring bits'*. The digital values in this section provide the same information as the revised ones but have a different interpretation.

It is recommended that these registers are not used for new applications.

Reference	Modbus Address	Description	Type	Read/ Write
CC	40011:1	Charge Cycle (Normal Operation)	Bit	R
OL	40011:2	Overload	Bit	R
MF	40011:3	Mains Failure	Bit	R
BCT	40011:4	Battery Condition Test	Bit	R
BP	40011:5	Battery Present	Bit	R
BM	40011:6	Battery Missing	Bit	R
BL	40011:7	Battery Low	Bit	R
BB	40011:8	Battery Bad	Bit	R
M?	40011:9	Power Supply or Mains Failed (Brown Out)	Bit	R
B?	40011:10	Possibly Battery Missing	Bit	R
SD	40011:11	System Down	Bit	R
BO	40011:12	Battery OK during mains/psu fail	Bit	R
Bcond	40011:13	Battery Condition Test Enabled	Bit	R
Ret	40011:14	Retry Battery Test on Fail	Bit	R
TempSign	40011:15	Temperature Sign (1 = Negative, 0 = Positive)	Bit	R
BatSign	40011:16	Battery Current Sign (1 = Out, = 0 In)	Bit	R
BCT Start	40012:1	Battery Condition Test Started	Bit	R
BCT Stop	40012:2	Battery Condition Test Stopped	Bit	R
BCT Enable	40012:3	Battery Condition Test Enabled	Bit	R
BCT Disable	40012:4	Battery Condition Test Disabled	Bit	R
CommsF	40012:5	Communications Failure to Power Supply	Bit	R
b?	40012:9	Possibly Battery Missing (Battery Bad)	Bit	R
bM	40012:10	Battery Missing (Battery Bad)	Bit	R
bO	40012:11	Battery OK during mains/psu fail (Battery Bad)	Bit	R
bL	40012:12	Battery Low (Battery Bad)	Bit	R
bP	40012:13	Battery Present (Battery Bad)	Bit	R

Digital Control

Reference	Modbus Address	Description	Type	Read/ Write
BCT Start	40013:1	Start Battery Condition Test	Bit	R/W
BCT Stop	40013:2	Stop Battery Condition Test	Bit	R/W
BCT Enable	40013:3	Enable Battery Condition Test	Bit	R/W
BCT Disable	40013:4	Disable Battery Condition Test	Bit	R/W

Analogue Parameters

Reference	Modbus Address	Description	Type	Read/ Write
Vout	40014	Output Voltage (Scaled 1:10; 245 = 24.5 Volts)	Register	R
Ibat	40015	Battery Current (Scaled 1:10; 123 = 12.3 Amps)	Register	R
Ipsu	40016	Power Supply Current (Scaled 1:10; 123 = 12.3 Amps)	Register	R
Temp	40017	Temperature (in degC)	Register	R

Analogue Settings

Reference	Modbus Address	Description	Type	Read/ Write
BatDetect	40018	Time in minutes between battery detect tests (in mins)	Register	R
Vpres	40019	Minimum voltage to detect battery presence (Scaled 1:10 in Volts)	Register	R
Vshutd	40020	Shutdown Voltage (Scaled 1:10 in Volts)	Register	R
Vbatl	40021	Battery low alarm voltage level (Scaled 1:10 in Volts)	Register	R
Vdisco	40022	Battery disconnect voltage (Scaled 1:10 in Volts)	Register	R
Bccl	40023	Battery charge current limit (Scaled 1:10 in Amps)	Register	R
BCTim	40024	Length of battery condition test (in mins)	Register	R
CC Mins	40025	Time interval between BCTs (in mins)	Register	R
CC Hrs	40026	Time interval between BCTs (in hours)	Register	R
CC Days	40027	Time interval between BCTs (in days)	Register	R
MfiBCT	40028	Mains fail check interval during BCT (in mins)	Register	R

Monitoring

Revised Digital Monitoring Bits

Modbus Address	Description	Type	Read/ Write
	BCT Related Digitals		
00030	BCT Active	Bit	R
00031	BCT Status(Enabled/Disabled)	Bit	R
00032	BCT Start (Acknowledge)	Bit	R
00033	BCT Stop (Acknowledge)	Bit	R
00034	BCT Enable (Acknowledge)	Bit	R
00035	BCT Disable (Acknowledge)	Bit	R
	Information Digitals		
00036	Charge Cycle (Normal Operation)	Bit	R
00037	Battery Ok	Bit	R
00038	Battery Present	Bit	R
00039	Battery Possibly Missing	Bit	R
00040	Possible Mains Fail (Brown Out)	Bit	R
00041	Battery Sign (Set for Negative/Discharge)	Bit	R
00042	Temperature Sign (Set for Negative)	Bit	R
00043	Retry Battery Test on Fail	Bit	R
	Alarm Digitals		
00044	Battery Bad	Bit	R
00045	Battery Missing	Bit	R
00046	Overload	Bit	R
00047	Communications Fail to Power Supply	Bit	R
00048	System Down	Bit	R
00049	Battery Low	Bit	R
00050	Mains Failure	Bit	R

Original Digital Monitoring Bits

The following coils have been replaced with the ones in the previous section '*Revised digital monitoring bits'*. The digital values in this section provide the same information as the revised ones but have a different interpretation.

It is recommended that these coils are not used for new applications.

Reference	Modbus Address	Description	Type	Read/ Write
CC	00001	Charge Cycle (Normal Operation)	Bit	R
OL	00002	Overload	Bit	R
MF	00003	Mains Failure	Bit	R
BCT	00004	Battery Condition Test	Bit	R
BP	00005	Battery Present	Bit	R
BM	00006	Battery Missing	Bit	R
BL	00007	Battery Low	Bit	R
BB	00008	Battery Bad	Bit	R
M?	00009	Power Supply or Mains Failed (Brown Out)	Bit	R
B?	00010	Possibly Battery Missing	Bit	R
SD	00011	System Down	Bit	R
BO	00012	Battery OK during mains/psu fail	Bit	R
Bcond	00013	Battery Condition Test Enabled	Bit	R
Ret	00014	Retry Battery Test on Fail	Bit	R
TempSign	00015	Temperature Sign (1 = Negative, 0 = Positive)	Bit	R
BatSign	00016	Battery Current Sign (1 = Out, = 0 In)	Bit	R
BCT Start	00017	Battery Condition Test Started	Bit	R
BCT Stop	00018	Battery Condition Test Stopped	Bit	R
BCT Enable	00019	Battery Condition Test Enabled	Bit	R
BCT Disable	00020	Battery Condition Test Disabled	Bit	R
CommsF	00021	Communications Failure to Power Supply	Bit	R
b?	00022	Possibly Battery Missing (Battery Bad)	Bit	R
bM	00023	Battery Missing (Battery Bad)	Bit	R
bO	00024	Battery OK during mains/psu fail (Battery Bad)	Bit	R
bL	00025	Battery Low (Battery Bad)	Bit	R
bP	00026	Battery Present (Battery Bad)	Bit	R

Control

Reference	Modbus Address	Description	Type	Read/ Write
BCT Start	00065	Start Battery Condition Test	Bit	R/W
BCT Stop	00066	Stop Battery Condition Test	Bit	R/W
BCT Enable	00067	Enable Battery Condition Test	Bit	R/W
BCT Disable	00068	Disable Battery Condition Test	Bit	R/W

REVISION HISTORY

Revision Number	Date Revised	Revised By	Description
1	10-Jun-08	RM	Initial Revision
2	16-Jun-09	RM	Reformatted Document and programming cable wiring information
3	9-Jul-10	RM	Added revised digital monitoring set

TERMS OF WARRANTY

Innovative Energies Ltd warrants its power supplies for 24 months (two years) from date of shipment against material and workmanship defects.

Innovative Energies' liability under this warranty is limited to the replacement or repair of the defective product as long as the product has not been damaged through misapplication, negligence, or unauthorized modification or repair.

Thank you for purchasing from Innovative Energies.

We trust your power supply will exceed your expectations and perform for years to follow.

Sincerely,
The Innovative Energies team.

Innovative Energies Limited

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